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TRAIL & LANDSCAPE



*A Publication Concerned With
Natural History and Conservation*

The Ottawa Field-Naturalists' Club

TRAIL & LANDSCAPE

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The Ottawa Field-Naturalists' Club

— Founded 1879 —

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Objectives of the Club: To promote the appreciation, preservation and conservation of Canada's natural heritage; to encourage investigation and publish the results of research in all fields of natural history and to diffuse the information on these fields as widely as possible; to support and co-operate with organizations engaged in preserving, maintaining or restoring environments of high quality for living things.

Club Publications: THE CANADIAN FIELD-NATURALIST, a quarterly devoted to reporting research in all fields of natural history relevant to Canada, and TRAIL & LANDSCAPE, a quarterly providing articles on the natural history of the Ottawa Valley and on Club activities.

Field Trips, Lectures and other natural history activities are arranged for local members; see "Coming Events" in this issue.

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TRAIL & LANDSCAPE

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Welcome New Members

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Nico Cordonier-Gehring & Family
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Niceolò Duini & Family
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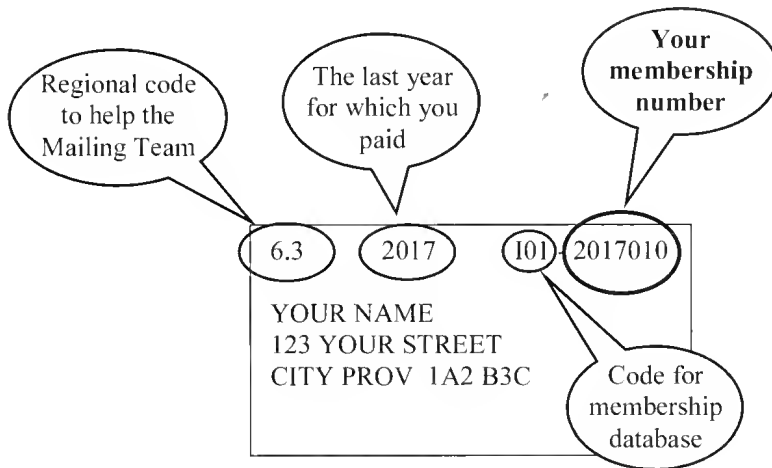
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Dayne Gellner

Henry Steger
Chair, Membership Committee
November 2016

Your OFNC Membership Number

Your OFNC membership number is the number that appears in the top right corner of the address label on the back of your *Trail & Landscape*.



This is your proof of membership. There are now events where you will be asked to provide your membership number in order to register or to attend.

Suggestions:

- Take a picture of your address label so you have your membership number with you when you go to an event
- Bring a copy of your *Trail & Landscape*

Also, as the Club is looking into creating online tools for its members, the membership number might eventually be used to create an account, to sign up for events online or to consult a publication online.

Thank you!

OFNC Research Grants: Announcing the 2016 Winners

The OFNC Publications Committee

In March 2015, the OFNC Board of Directors approved a motion that the Club establish an OFNC Research Grants program to support field-based natural science research projects in eastern Ontario and western Quebec. This new program aligns perfectly with one of the main goals of the OFNC: to encourage investigation, publish the results of research in all fields of natural history, and diffuse the information as widely as possible. A total of \$15,000 is available for research projects each year. The funding must go to individuals, not organizations, and the funding cannot be used for salary. The research grants program is overseen by the OFNC Publications Committee. The call for funding for the 2017 field season, with a deadline of 15 January 2017, is in this issue of *Trail & Landscape* (page 28) and posted on the OFNC website. Funding announcements will be made in the spring.

The Club's 2016 call for proposals was sent out widely in November 2015 with a deadline of 15 January 2016 for submitting a proposal. Eleven proposals were received. A small subcommittee convened and chaired by Dr. Tony Gaston reviewed all proposals and recommended funding nine of them. The funding recommendations were submitted to the Board of Directors, who approved all of them. One applicant subsequently declined the funding, resulting in eight projects being funded. The following projects, listed in alphabetical order, were funded this year:

1. Emily Austen, post-doctoral fellow, University of Ottawa. The ecological significance of pollen colour variation in Trout Lily (*Erythronium americanum*).
2. Julia Charlebois, M.Sc. candidate, University of Ottawa. Do invasive plants impose selection on native plants' flowering time?
3. Jean Faubert, Société québécoise de bryologie, and Alexandre Blain, FloraQuébeca. Flore du parc de la Gatineau/Gatineau Park.
4. Robert Forsyth, Research Associate, New Brunswick Museum, Paul Catling, independent researcher, and Annegret Nicolai, Université de Rennes (France). Surveys of rare and potentially at-risk species of land snails in the Ottawa area.

5. Mary Ann Perron, PhD candidate, University of Ottawa. Tracking successional development of a newly constructed riverine wetland.
6. Frederick W. Schueler and Aleta Karstad, Bishops Mills Natural History Centre. Auditory Monitoring in Eastern Ontario.
7. David Seburn, Seburn Ecological Services. Identifying new locations in eastern Ontario where the Blanding's Turtle occurs. (See summary on page 7.)
8. Maria Vu, M.Sc. candidate, University of Ottawa. Hormone-based spawning induction for the captive breeding and conservation of amphibians.

As a condition of receiving support from the OFNC Research Fund, all grant recipients are expected to submit a summary of their work for publication in *Trail and Landscape*, so stay tuned to learn about the results of these exciting and important local research projects.



The introduced European Dark-bodied Glass-snail, Oxychilus draparnaudi, crawls over woody debris in the ravine at Billings Estate, Ottawa. It was found by researchers of the project "Surveys of rare and potentially at-risk species of land snails in the Ottawa area". While the purpose of this research was to find and document native rare and potentially at-risk species of terrestrial snails and slugs, non-native species such as this one were commonly encountered at some of our more urban sites. Billings Estate was chosen because it's one of several now urban localities where early Ottawa Field-Naturalists' Club members found species of interest many years ago. Photo by Robert Forsyth.

A makeover for *Trail & Landscape's* 50th Birthday

Annie Bélair

Trail & Landscape was created in 1967. The OFNC wanted a club newsletter that would include regional observations and articles on conservation issues. It also wanted a club project for the Canadian Centennial.

And now, on the 150th anniversary of Canada, it is turning 50 years old.

To celebrate this great achievement, *Trail & Landscape* is undergoing an intensive makeover! The first two issues of 2017 will include colour pictures. Then the third issue, which will be the July-September issue, will be completely different. We are giving it a modern, vibrant look: it will be printed on 8.5 x 11 paper and in full colour. But the content won't change: it will still have articles on the Club's business and operations, articles on observations and personal experiences written by volunteers, and the list of coming events.

We hope you will enjoy T&L's new look!

If you would like to contribute something (an article, a photo, a short note, etc.) to add to this celebratory issue, please contact the editor at annie.TandL@gmail.com.



Surveying for New Populations of Blanding's Turtles

David Seburn

A project supported by the 2016 OFNC Research Grants Program.

The Blanding's Turtle, with its bright yellow throat, is well known to many naturalists. It is also listed as a threatened species according to both the federal *Species at Risk Act* and the Ontario Endangered Species Act, largely because of habitat loss and the effects of traffic mortality. The Blanding's Turtle is known to be

widespread in Ontario, but its complete distribution is not fully known. Recent surveys have found previously unknown sites or confirmed the presence of historical populations, suggesting that additional surveys would be worthwhile.



*A Blanding's Turtle.
Photo by David Seburn.*

The Endangered Species Act protects the habitat of threatened and endangered species through habitat regulation. For the Blanding's Turtle, this includes all suitable wetlands within 2 km of known observations of the species. Habitat regulation cannot apply unless a site is known, so identifying previously undocumented sites with Blanding's Turtles is a high priority.

To try and find undocumented sites with Blanding's Turtles, I undertook surveys for this species in the spring and summer of 2016. There are many ways to survey for Blanding's Turtles, but one of the most effective means to survey large areas is to conduct driving surveys during the turtle nesting season, looking for individuals that were killed trying to cross roads. Using maps from the Ontario Reptile and Amphibian Atlas, it was clear there were many areas lacking Blanding's Turtle

observations southeast of Algonquin Provincial Park, so my survey area stretched from west of Bancroft to east of Plevna, and from Barry's Bay in the north to south of Bon Echo Provincial Park.

I conducted a total of eight road surveys, with each survey taking three days to drive the entire area. In addition to road surveys, I stopped at roadside wetlands and scanned the areas with binoculars looking for basking Blanding's Turtles. The surveys were conducted weekly from 17 May until 7 July, and over the course of those 8 weeks I drove just over 11,000 km.

I found 11 Blanding's Turtles along various roads (Figure 1), and luckily not all of them were dead. Some I managed to help across roads before they were hit. For each Blanding's Turtle encountered, I took a photograph of the turtle to document the observation and determined the location with a GPS. The majority of the observations represent new locations for the species, so wetlands in those areas will receive additional protection through habitat regulation.

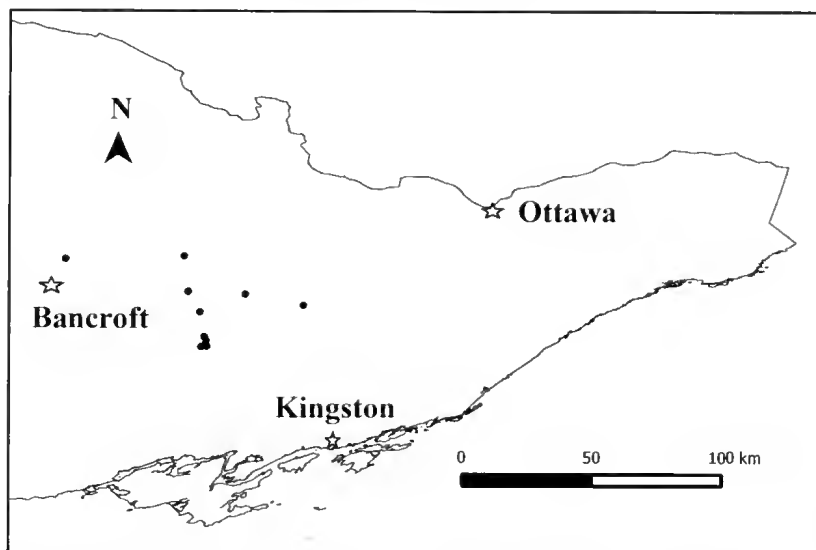


Figure 1. Location of 11 Blanding's Turtles (black dots) found during road surveys in spring and summer of 2016. Some Blanding's Turtles were found close to each other, resulting in fewer than 11 locations appearing on the map.

I also kept track of all reptiles found on roads during the survey. In total, I encountered 202 reptiles on the roads, or in wetlands adjacent to the road. No Blanding's Turtles were seen in roadside wetlands, but a number of Painted Turtles and a few Snapping Turtles were seen basking. Just considering the data from roads, I found 139 reptiles, most of which were dead. There were 104 turtles and 35 snakes found on the roads. The larger number of turtles is likely because of two reasons.

First, the surveys were conducted when turtles are most apt to be on roads: during the nesting season when females are moving about on land looking for places to lay their eggs. Second, snake bodies are often quickly scavenged from roads by various kinds of wildlife, while turtle bodies can remain on the road or road shoulder for longer periods of time, meaning they are more apt to be found and counted.

Not surprisingly, the Painted Turtle was the most common reptile found on roads, making up just over half of all the reptiles. The Northern Watersnake was the most commonly encountered snake, making up approximately 10% of the observations. In total, I found four species of turtles on roads (Blanding's, Northern Map, Painted, and Snapping) and three species of snakes (Eastern Gartersnake, Milksnake, and Northern Watersnake). Aside from the Blanding's Turtle, none of the other reptile species are listed as threatened or endangered, so no additional habitat protection will result for them. Both the Map and Snapping Turtles are listed as species of special concern, (and the Milksnake was only recently downlisted from special concern to not at risk), but habitat regulation only applies to threatened and endangered species.

All of the Blanding's Turtle data collected as part of this project were submitted to the Ontario Ministry of Natural Resources and Forestry. The data collected on other turtles and snakes were submitted to the Ontario Reptile and Amphibian Atlas to help document the distribution of these species in the province. The Ontario Reptile and Amphibian Atlas uses 10 x 10 km grid squares to map the distribution of species, and it looks like a number of my observations, particularly some of the roadkilled Milksnakes, represent the first record for that species in those squares. The data on roadkill rates are also valuable for indicating which species are most vulnerable to traffic mortality. Roadkill takes a huge toll on many species of wildlife, but it is also a valuable way of surveying for those species.



A Blanding's Turtle crossing the road. Photo by David Seburn.

Ode-ing in Ottawa's Urban Ponds

Mary Ann Perron

A project supported in part by the 2015 OFNC Research Grants Program.

Urban areas are often overlooked by naturalists, but there can be pockets of beauty and biodiversity in cities that are well worth exploring. Ottawa has over 100 urban ponds scattered across the city, ranging in age from 1 to 35 years. (For an example of a pond, see Fig. 1.) These ponds were built to retain stormwater runoff, prevent flooding, and improve the quality of downstream waters by filtering this runoff (Ellis & Rivett 1991). Most new subdivisions include one or more urban ponds. Collectively, these systems present a unique habitat for wetland species within the city limits.



Figure 1. Newly constructed urban pond in Barrhaven, Ottawa, Ontario.

Urban ponds attract dragonflies and damselflies (Odonata), and I chose to study these insects because they are well-established biological indicators reflecting the quality of their habitat as well as the health of other species (Briers & Biggs 2003, Kutcher & Breid 2014). Odonates have a complex lifecycle, consisting of an aquatic larval stage as well as a terrestrial (aerial) adult stage. These lifecycle characteristics bridge the aquatic and terrestrial habitats of wetland ecosystems.

I studied adult odonates at 41 urban ponds within Ottawa as part of my research for my doctoral thesis. The study ponds were selected based on several criteria. The ponds had to be under 1 ha in size to standardize for species-area relationship and had to be at least 1 km away from a large body of water (river and/or lake) to avoid population overlap of lacustrine and riverine species. A timed visual survey was conducted twice at each pond (once in early summer and once in late summer) in order to encounter early and late season species. Adult odonates were sampled between 10:00 am and 4:00 pm under at least partially sunny conditions with wind speeds below 30 km/h to ensure optimum flight activity. The survey was conducted by walking slowly along the perimeter of each pond for 60 minutes, visually identifying individuals. If I was unable to identify the species by sight, the individuals were caught with a sweep net, the time was stopped, and the insect was identified to species using a field guide (Butler & deMaynadier 2008).

What I discovered was that these urban ponds are home to an impressive suite of species, attracting 40% (48/120) of the total number of recorded species in the Ottawa-Gatineau area. Many of the species present were common species such as the Twelve-spotted Skimmer (*Libellula pulchella*) or the Dot-tailed Whiteface (*Leucorrhinia intacta*), but also included the presence of a handful of uncommon species such as the Slaty Skimmer (*Libellula incesta*) and the Calico Pennant (*Celithemis elisa*) (Fig. 2). During my 2015 field season, I observed a new species for the area, the Eastern Amberwing (*Perithemis tenera*). This amberwing is a more southern species, with a home range extending to Mexico; its presence may indicate that this species is extending its home range to more northern latitudes as a result of climate change.



Figure 2. Uncommon dragonfly species, the Calico Pennant (*Celithemis elisa*), caught in an urban pond in Manotick, Ottawa, Ontario.

Species richness at individual ponds ranged from 4 to 21 species. This is actually quite similar to the numbers that I found at several natural ponds across the region. The next step in my research is to determine what might explain this wide variation in odonate diversity in urban ponds and what conditions are associated with good wildlife habitat. Many urban ponds are hidden gems when it comes to odonating in the National Capital region, and these areas must not be overlooked as valuable resources for urban diversity.

Acknowledgments

I would first like to thank the OFNC for partially supporting this study and encouraging young naturalists (such as myself) to find a passion for nature and wildlife. I would like to thank my supervisor, Dr. Frances Pick, for her guidance, and my field assistant, Holly McCulloch, for all the hours of hard work collecting data. Thanks to the collaboration with the City of Ottawa, funding agencies (NSERC), and thanks to Dr. Paul Catling for some ID help.

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Fabulous Fall Fungi Workshops – 7 years of 'shrooming and still going strong

Barry Cottam

Twelve mushroom enthusiasts, veterans and newbies alike, got caught up in a whirlwind of fungi collecting and identification at a five-day Fabulous Fall Fungi workshop, held September 25-30 at Queen's University Biological Station (QUBS) near Westport, Ontario. Richard Aaron has offered these workshops, usually on a three-day basis, for seven years now. This five-day workshop was a first, and something of an experiment. Under his enthusiastic guidance, we all happily worked long and hard, a typical day being out in the woods collecting during the mornings, then back to the classroom after lunch to lay out our treasures and begin identifications. Evenings were spent on more identifications and occasional presentations, including *Spirits of the Forest*, a recent documentary by Taylor Lockwood, long-time mushroom photographer who travels the world with his GoPro camera seeking out bioluminescent mushrooms.



A tableful of mushrooms – just getting started on day one!

Identifying all the many species collected proved impossible, though many put in yeoman service in the attempt. Richard and some of the veterans stayed up past midnight most nights although many of us retreated to our cabins by 9:00 p.m. or so after our full days in the fresh air! Speaking of cabins, accommodations vary considerably at QUBS. Some people bunk up with others in larger cottages, but several of us chose cabins of our own. Most cabins come with comfy beds, views of the lake and are deeply quiet at night, although the smaller three-season cabins lack bathrooms.

Throughout the workshop, Richard kept up an interesting litany of stories about fungi, fungi folk, experiences in the field – not to mention myriad names, stored in his encyclopedic databank-brain, and lessons on mushroom characteristics and identification features. For each workshop, he hauls out his shelf-full of mushroom books and guides. A couple of microscopes are available too, but we didn't have much time to get to that level.

I should note that this is not a foraging workshop. While Veronica, the wonderful cook at QUBS, was willing to turn select finds of edibles into delicious snacks and side dishes – the sautéed puffball was especially yummy – the emphasis is on learning about fungi of all kinds and their identification through characters and keys.



A potentially poisonous Amanita species.



Mycena leaiana, taken at Hawk Ridge.

As noted above, some people return to these workshops year after year, or come back for at least one or two more sessions to brush up on their knowledge. Each year varies, depending on weather, especially rainfall. But the sites visited can vary as well. We spent the first day at QUBS, in the morning taking an orientation tour of the nearest woods as Richard pointed out many things.

After lunch, we went over to Cow Island to collect on our own. I think I was the only one who managed to get lost! Yes, bring a whistle – it was on the list but I didn't take this requirement seriously enough. That first evening we toured the recently built biology building, including its herbarium. Most interestingly, we met Evaristo Hernandez-Fernandez, a young artist from Mexico who spent the summer at QUBS as artist in residence. He was busy working up paintings of birds for a new book by Cornell University Press. He graciously took time to review his excellent work with us and answer our many questions.

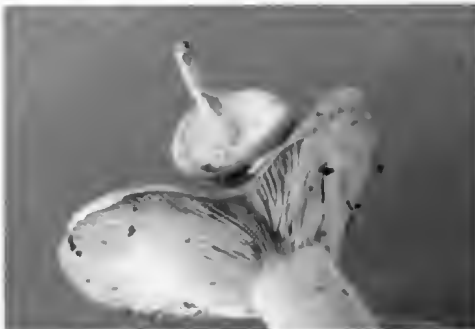


Strobilomyces strobilaceus, aka, for obvious reasons, Old Man of the Woods – a fun find.

We visited three other sites during the week, which involved car-pooling for half-hour drives to Foley Mountain Conservation Area, whose cliffs with their lovely views of Westport provided an excellent spot for our bag lunches, and a couple of Nature Conservancy of Canada (NCC) properties, Millburn Creek and Hawk Ridge. Hiking these areas was a pleasure, although the terrain could get a little rough off-trail. But being in the woods, focussed on the search, is always good. In return for permission to collect in these areas, Richard provides species lists to the NCC, so essentially we're doing some citizen science. As well, he keeps a running list of mushroom species found in each workshop. The tallies for the three workshops of this seventh season came to 309 mushrooms identified to species, of which 78 were new. Many more were identified to genus, but the hard rule of thumb is every hour in the field leads to eight hours of identification in the lab. Our new species count

made a good contribution to the grand total of 467 new species identified since the very first workshop in 2009.

Prior to the workshops, Richard scouts areas to visit, including good spots for lunch breaks. One day we stopped at Wendy's Farm Market, just up the road from the Ontario Water Buffalo Farm. I can recommend the water buffalo cheese and the home-made Maple White Bread. Good thing we're not studying mammals in the field – those water buffalo are huge!



This example of the rare but widespread parasitic Nyctalis asterophora fruiting body on its host Russula species generated much interest.

Perhaps the only jarring note for some of us was the need to toss out the previous day's finds to make room for the current ones. It had to be done, or we would have soon been overwhelmed with spoiling mushrooms. Samples of each species identified were labelled and kept, so that we could study them as we tried to identify each day's finds. The steady accumulation of these samples was truly impressive, covering four or five folding tables by the end of week. It was fun, too, to find non-fungal organisms – various species of small frogs, a salamander, deer most mornings on the main QUBS lawn... As an amateur entomologist, I was particularly interested in the various arthropods that crawled out of mushrooms, both in the field and in the lab, an interest that had to be put on indefinite hold!

So, what did we learn? Several core lessons are: in many cases, 100% positive identification of mushrooms is very difficult at our amateur level, owing to the facts we cannot do DNA analysis and the ongoing changes taxonomists continually make in this relatively new field; hence, guide books often vary in the names they use, including the scientific ones; nonetheless, we should use scientific names as much as possible, since common names either don't exist or were made up for the guide books and change over time and place anyway. These are a few of the difficulties the serious student confronts. More positively, we received much information on the morphology of mushrooms, their basic types and immense variation and their still not well understood but fascinating importance in ecological systems. At a practical level, we learned how to make spore prints – glass, being neutral, is the recommended base – to aid in identification; the rudiments of collecting, from tools to techniques to conditions; and the real need for great caution before deciding what is and isn't edible. Oh, and those that are edible can be delicious! We also learned that English Canada is well behind in 'shrooming endeavours: some of the best information sources come from Quebec, generated by an enthusiastic and dedicated community of amateur mycologists.

Richard Aaron is a man of passion and I find it remarkable that he can keep more than one on the go. In addition to his years offering the Fabulous Fall Fungi workshops, Richard also does nature tours and hikes in and around his home base of Toronto. His enormous energy most recently has found an outlet for another passion: mothing. He has established a mothing group with the ambitious goal of identifying 1000 species within a Toronto park, already over half-way there. For more on these and other activities, and to contact Richard directly, visit his website at <http://natureknowledge.weebly.com/>.

Thanks to David Seburn and Francis Cook for identifying the Red-spotted Newt, *Notophthalmus viridescens viridescens*, a subspecies of the Eastern Newt, *Notophthalmus viridescens*.



A Red-spotted Newt (Notophthalmus viridescens viridescens) hides under a rotting log in a maze of fungal hyphae.

February

Linda Jeays

Desperate for the touch
(snow brushing across my face)
of butterfly wings.

Earthworms: Pathway for Invasion

Annise Dobson



Figure 1. European earthworms are readily available as fishing bait.

You may expect that earthworms have always had a place amongst the leaf litter of our native forests. However, all of the earthworms found in Ontario are non-native species from Europe and Asia, although they are given misleading names such as “Canadian Nightcrawlers” and “Alabama Jumpers”. For the last 11,000 years since the glaciers receded, ecosystems in the Northern United States developed and evolved without earthworms (James 1995). During the late 1800s and early 1900s many settlers imported European plants that likely had earthworms or earthworm cocoons (egg cases) in their soils (Bohlen et al. 2004). More recently, the widespread use of earthworms as fishing bait has spread them to more remote areas (Sackett et al. 2012).

Earthworm Impacts

Without earthworms, microbes, fungi and soil invertebrates cause fallen leaves to slowly decompose. This creates a spongy layer of organic “duff” which is the natural substrate for native woodland wildflowers and many tree seedlings. Invading earthworms consume the leaves that create the duff layer and often eliminate it completely. This results in sweeping above-and-below ground changes, spanning across trophic levels. Sharp declines in soil invertebrate communities are common

symptoms in earthworm invaded areas (Zirbes et al. 2012; Trouve et al. 2014). The loss of soil invertebrates can have widespread consequences, including impacts on species that depend on soil invertebrates for food, such as the ovenbird, hermit thrush and many species of salamanders. Problems caused by declines in food availability may be compounded for birds by reduced nest success resulting from a decline in shrubs that provide concealment, and for salamanders, by the loss of temperature- and moisture-buffered habitat (Maerz et al. 2009).



Figure 2. Above: Earthworm-invaded soil profile lacking stratification. Below: Intact duff layer over stratified soil profile without earthworms.

Big trees with deep roots are generally unaffected, but evidence is emerging to suggest native understory plant diversity is negatively affected (Hale et al. 2006; Dobson and Blossey 2015). Conversely, some of the most common invasive plant species appear to benefit from worm invasion (Nuzzo et al. 2009). Many studies have shown earthworms to be a strong selective factor in determining plant community assemblages, with an overall decrease in species richness (McGraw and Furedi 2005; Frelich et al. 2006; Holdsworth et al. 2007; Dobson and Blossey 2015).

Get to Know your Earthworms

Not all earthworms are created equal. They differ in behaviour, food, habitat preference and impact on ecosystems.

- **Endogeic** earthworms feed in the soil and live in horizontal burrows. These earthworms will interact with deeper-rooted plant species, and have a large impact on soil stratification and nutrient leaching. Because they live in deeper soil layers, they are rarely pigmented.
- **Anecic** earthworms feed on both soil and leaf litter. They can have deep vertical burrows, allowing them to access leaves on the soil surface and retreat to lower levels. Anecic worms, such as the Canadian Nightcrawler, *Lumbricus terrestris*, grow very large and can consume an entire season's worth of leaf litter, leaving bare ground with deteriorated soil structure. These worms can be deeply pigmented, particularly on their dorsal side.
- **Epigeic** earthworms live in leaf litter, feeding on organic matter, microbes, fungi and even live plant roots. While a small density of epigeic earthworms may not have enormous impacts on forest cycling, once established, they may disproportionately affect shallow-rooted perennial plants, soil invertebrates and ground-dwelling vertebrates. Because they dwell near the soil surface and are exposed to UV radiation from the sun, epigeic earthworms are often highly pigmented. Some epigeic earthworms, such as the Alabama Jumper, *Amyntas agrestis*, are voracious eaters, fast growers, and can reach incredible densities. They consume vast amounts of organic matter, and create gravel-like castings in which even the most robust of plants cannot survive.



Figure 3. *Lumbricus terrestris*, in a midden above its deep vertical burrow.

Due to the wide range of possible impacts from different species, it is important to understand what kind of earthworm community you are dealing with.

Earthworm Sampling

There are several earthworm sampling methods, but mustard extraction is one of the easiest, safest, most accurate, and most fun! First, mix 1/3 cup of ground mustard seed per gallon of water, mix well and let sit for at least 15 minutes. Next, acquire a quadrat (50cm x 50cm works well), and choose your location. Remove the top layer of leaf litter and manually search for any small epigeic earthworms hidden on the



Figure 4. Sampling earthworms using the liquid mustard method.

underside of leaves. Pour half of the gallon slowly over the ground underneath the quadrat. The mustard liquid irritates the earthworms' skin and will cause them to come up to the surface. Here, you can rinse them with water, place them in a dish and identify them in the field. If they cannot be identified in the field, you can kill them in 70% ethanol, fix them in 10% formalin, preserve them in 70% ethanol, and identify them using a dissecting scope and a dichotomous key. I would recommend Cindy Hale's *Earthworms of the Great Lakes*, available from the Great Lakes Worm Watch website, www.greatlakeswormwatch.org.

Active Areas of Research

Understanding the sum total of earthworm influence is complicated, because direct, indirect, biological, physical and chemical changes are occurring simultaneously. In my research, I seek to understand changing impacts of earthworms throughout the life cycle of 21 native plant species, including ferns, grasses, sedges, trees, shrubs and herbs. All species are planted into 20 plots with variable earthworm abundances. Initially, seedling survival was almost universally lower in earthworm-invaded plots, with the exception of two fern species. We hypothesize that by removing the forest floor and its temperature- and moisture-buffering capacity, earthworms contribute to young seedling desiccation and death (Larson et al. 2009). Species in the order Liliales (Trillium, True and False Solomon's Seal) are particularly hard-hit, continually declining each year in earthworm invaded plots.

However, active restoration may provide a solution in forests where earthworms have depleted understory communities. Transplanted seedlings of many species that survived the harsh conditions in initial growing seasons in earthworm invaded plots are very likely to survive, flourish and reproduce in bare, post-invasion soils.

We are currently seeking to elucidate the mechanisms underlying earthworm influence on plant success. Earthworm activity has enormous influences on macro- and micro-nutrient cycling. Rapid decomposition of organic matter may increase bioavailability of nutrients, but they may be rapidly lost from the system through leaching (Scheu 1994; Bohlen 2004). Therefore, we expect earthworms to widen the breadth of ecological “winners” (rapidly-growing species that can take advantage of nutrient pulses), and “losers” (slow-growing perennials that cannot). This may be exacerbated by the close dependence of the latter on mycorrhizal symbionts to provide previously unavailable nutrients (Lawrence 2003).

Control Recommendations

Currently, we have no viable earthworm control methods to recommend. Pesticides, predators and parasites known to affect earthworms would all have large consequences for other forest species and cycles. However, the news is not all bleak, and we are just starting to understand earthworm population dynamics. Anecdotal evidence from soil profile legacies in my research sites suggest that certain earthworm populations may crash and disappear from an area if there are no new introductions, although the mechanism is unknown.

The Great Lakes Worm Watch Program (www.greatlakeswormwatch.org; also Callaham et al. 2006) is an educational resource that has seen some success in preventing spread of earthworms, particularly a very problematic new invader, *Amyntas*. In addition to very readable background information, it provides standardized protocols for citizen scientists and educators to determine the extent of earthworm invasion, the species present, and a means to analyse the data. It also provides games and lesson plans for educating students of different ages.

Public awareness is key to this effort, and fishermen and users of vermicomposters should be strongly discouraged from releasing earthworms or their egg cocoons into the wild. Egg cocoons can be transported in the wheels of ATVs, logging equipment, and may even hitch a ride on the treads of your hiking boots (Sackett et al. 2012; Drouin et al. 2016). Finally, attention should be given to ensure potentially contaminated soil is not being transported between regions. On their own, earthworms rarely exceed 10m per year (Tiunov et al. 2006; Hendrix et al. 2008).

Conclusion

Earthworm invasion causes a cascade of changes to diverse species in North American forests. Changes include direct and indirect impacts, often mediated by chemical, biological and physical changes to soil. Although no recommended control options exist, earthworms are uniquely poor at spreading without humans doing the legwork for them. Therefore, limiting earthworm transport has the capacity to drastically slow earthworm invasion.

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Ralph the Randy Earthworm

Murray Citron

Ralph the randy earthworm
Burrowed underground
And converted into something else
Anything he found.

Ralph could neither see nor speak
And never heard a thing
But through his epidermis Ralph
Felt Darwin vibrating.

Mutability is the law of life.
Ralph even mastered gender-shift,
Muscular as Muhammed Ali
And slender as Taylor Swift.

Ralph was rich in progeny,
Generations proud and glad
That Ralph could be both he and she,
Mom to some, to others Dad.

Invasive Anthems

Fred Schueler and Aleta Karstad, with some lyrical help from Adam Zieleman

♪ Sung to the tune of “O Canada”.

<p><i>Siberian Elm</i>, the true Canadian tree, Never cut down, has immortality. From magazine back covers it has spread from sea to sea, and with its slippery wives it spawns a mongrel progeny. <i>O pumila</i>, <i>O pumilamity</i>, poom, poom, poo-poom, it's everywhere, you see. poom, poom, poo-poom, it's everywhere, you see.</p>	<p><i>Ulmus pumila</i> occupies the towns, homesites, and roadside rest areas of the Prairies and the valleys of interior BC like an army, and, as in Ontario, seems to grow better at the edge of gravel road shoulders than any woody native species does. It's resistant to the Dutch Elm disease, and hybridizes with the native Slippery Elm (<i>Ulmus rubra</i>).</p>
<p><i>Melilotus</i>, the robust roadside weed providing surviving Bees with what they need yellow or white it lines highways from NB to BC, after a thousand waypoints we're still in perplexity. Sweet Clover, sweet, glorious for Bees! <i>O Canada</i>, we waypoint these for thee. <i>O Canada</i>, we waypoint these for thee.</p>	<p>We found that Yellow Sweet-clover (<i>Melilotus officinalis</i>) replaces <i>M. alba</i> on dry and disturbed soils in the east and in lowland BC, and dominates wide areas of the southern Prairies. We really need to go back to 2010 to have even 500 Sweet-clover waypoints (there were 353 in 2015), and while we haven't analysed the data, we're not actually feeling very perplexed by this right now. It's an astonishing thought that none of our clovers are native to North America.</p>

<p><i>The Scottish Pine, diseased in Bishops Mills, feels the Lee Valley teeth and takes a spill. For height and width we quantify yearly growth metrically, and in the stove it heats the house: combustion ends its spree. Keep, keep, the land from spinning alien seed, White, Red, and Jack are all the Pines we need. White, Red, and Jack are all the Pines we need.</i></p>	<p>We're cutting volunteer <i>Pinus sylvestris</i> that's been dying of a mysterious blight around our land at home since the 2012 drought. Owen Clarkin says that Pine Wilt (<i>Bursaphelenchus xylophilus</i>) commonly kills Scots Pine quickly like this. "This is a North American pest which is very effective at killing <i>P. sylvestris</i> and <i>P. nigra</i> [Austrian Pine]. It's a nice change to have a native killing off an alien, but unfortunately, it's gotten a foothold into the Old World... the familiar globalized world story." (No product placement funds or favours have been received from Lee Valley Tools.)</p>
<p><i>Phragmites</i> grows where culverts are replaced Long Swamp (the Fen) – the Counties' great disgrace. With backhoes, scoop them out, but fail to get each rhizomes' tail, across the ditch, they then arise, the song is "fail, fail, fail." Come spring the province brings in glyphosate... <i>Hemidactylium</i>, on guard for thee, <i>Utricularia</i>, on guard for thee.</p>	<p>This is about the European Reed colony the United Counties of Leeds and Grenville introduced when they replaced a culvert in North Augusta Road at the Long Swamp Orchid Fen in 2008 – we've been nattering at them to do something about it since we first noticed it in 2009. The partial backhoe scoop was made in 2012. The presence of <i>Hemidactylium</i> (Four-toed Salamander) around the Orchid Fen is likely but hypothetical; <i>Utricularia geminiscapa</i> (Twin-scaped Bladderwort) is the rarest of 3 rare Bladder-worts found in the Fen.)¹</p>

<p><i>Australis sub australis</i> heading west As if Alberta's ditches were the best. At Mortlach in Saskatchewan the leading cohort grows between the CP railway and the TransCanada road. Head West, young Reed, along the rail and road Nobody minds, until you're over-growned Nobody minds, until they're over-groaned.</p>	<p>11 October 2014, Canada: Saskatchewan: 11.3 km W Mortlach. (25m waypoint), 72J/8, 50.45576N 106.22696W TIME: 1342. AIR TEMP: 20°C, sunny, windy. HABITAT: edge of pond at foot of grassy railway embankment. OBSERVER: Frederick W. Schueler, Aleta Karstad Schueler. 2014/307/c, <i>Phragmites</i> <i>australis</i> SUBSPECIES: cf <i>australis</i> (European Reed) (Plant). 2/1 stand herb, in fruit, specimen. WAYPT/013, 10 m pointed- headed vividly green stand just at foot of railway embankment and into deep pond. Stems green and micro-rough. We visited this stand again this summer and just need to get the specimens to Paul Catling for definitive identification; Paul and Gisèle Mitrow have published warnings of the problems the invaders could cause if they reach irrigation ditches in Alberta.ⁱⁱ</p>
<p><i>O</i>, Caprine food, <i>Rhamnus cathartica</i>. Ubiquitous as noodles in a pho With axe and saw we take you down to feed the bleating throng, and open space for native brush to sunbathe all day long. Canada Plum, Dogwood, and Saskatoon O brushy old fields, we're defending thee, O brushy old fields, we're defending thee.</p>	<p>This is about feeding our goats on Cathartic Buckthorn, Scots Pine, and Cedar in the winter of 2014- 2015, cutting stems with a brush axe or pruning saw, offering them to the goats to eat the leaves and twigs, processing the stems with brush axe and chainsaw to</p>

	<p>extract stems large enough to be useful as firewood, and then tossing the remaining branchlets onto brush piles.ⁱⁱⁱ Adam Zieleman had recently taken us to a Vietnamese restaurant where the pho soup (pronounced ‘phuh’) contained a less-than-usual amount of meat and herbs among its dominating noodles.</p>
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i) Schueler, Frederick W. 2013 [1995]. *Ecology of the Kemptville Creek Drainage Basin*. (derived from a document prepared for the Rideau Valley Conservation Authority by Kyle Simpson, April 1995, and revised by Lynn Preston, June 1995) in Schueler, Frederick W. and Aleta Karstad. 2013 [2014]. *Landscape: Progress towards a philosophy of sustainable occnpancy*. Library of One Thing and Another, Bishops Mills, Ontario. Paperback, 222 pages, 44 black & white illustrations, 1 map. <http://pinicola.ca/books/landscape.htm> (Table 4 pp. 185-186: this is based on an admirable unpublished 1987 wetland evaluation by Schlesinger, the citation to which was inadvertently left out of the original document, and which we’re in the process of recovering). It’s interesting to see that in 1995 we listed *Phragmites* (not yet partitioned into native and alien strains), as a “species not listed as invasive by White *et al.* (1993). Native to Ontario, but not seen in undisturbed sites in the Drainage Basin, where stands seem to be spreading in wet roadsides, perhaps in response to road salt.”

ii) Catling, Paul M., and Gisèle Mitrow. 2011. *Major invasive alien plants of natural habitats in Canada. 1. European Common Reed (often jnst called Phragmites), Phragmites australis (Cav.) Trin. ex Steud. snbsp. australis*. CBA Bulletin 44 (2): 52–61. http://www.cba-abc.ca/Bulletin_44_2.pdf

iii) Schueler, Fred. 2016. *Brush piles: improving backyard habitat*. *Trail & Landscape* 50(2):62-68. Edited-down version of <https://ofnc.wordpress.com/2016/02/15/brush-piles-improving-backyard-habitat/>

OFNC Research Grants: Call for Proposals for 2017

The OFNC Publications Committee

The OFNC has established a fund to support field-based research activities that reflect and promote the Club's objectives within eastern Ontario or western Quebec, focused particularly upon the Club's study area – inside the 50-km radius from the Peace Tower in Ontario or Quebec.

The objectives of the Ottawa Field-Naturalists' Club are:

- To promote the appreciation, preservation, and conservation of Canada's natural heritage;
- To encourage investigation, publish the results of research in all fields of natural history, and diffuse the information as widely as possible;
- To support and cooperate with organizations engaged in preserving, maintaining or restoring environments of high quality for living things.

Deadline for proposal submission: 15 January 2017

Available Funding:

It is expected that grants will typically range from \$1000–\$3000.

Eligibility:

Individuals, including students conducting research for their degrees, postdoctoral fellows, professors, research scientists and independent researchers.

Types of Research Supported:

Research projects must be credibly science-based and with a measureable outcome. Given the Club's focus on natural history, field-based projects are favoured.

Use of Funds:

Grants may be used for legitimate field-related expenses including travel, accommodation, food, equipment and supplies, etc. Grants may not be used for salary. Only a small portion of funds may be used for publication costs and/or laboratory analyses, and this must be justified in the application.

Application Process:

To apply for an OFNC research grant, please submit a project proposal with the following information. Maximum two pages.

1. Project title

2. Name(s), affiliation(s) and contact information of primary researcher(s), including supervisor name for students. The applicant(s) should indicate if they are a member of the Ottawa Field-Naturalists' Club or a subscriber to *The Canadian Field-Naturalist*.

3. Project team members

4. Research experience (brief summary of relevant experience)

5. Summary of the proposed research

Describe your research project in plain language. The summary should include and/or address the following:

- Provide a brief background summary of the research topic, its relevance to the local area, and describe the questions the project is addressing.
- How does the research contribute to the objectives of the OFNC?
- Explain the methods by which the work will be conducted, including the site(s) where it will be undertaken.
- Indicate if relevant permits have been or will be obtained/applied for and if any land access permission is required.
- Describe the timeline for the project.
- If your work involves collecting specimens, state where this material will be permanently deposited.

6. Proposed Budget

Provide the following information:

- Amount requested from OFNC.
- Total budget for the project.
- Other sources of funding (if applicable).
- How and when OFNC will be funds be used.

7. Submission

Submit your proposal in PDF format by email to: Tony Gaston (tonygastonconsult@gmail.com) and Jeff Saarela (jsaarela@mus-nature.ca), with "OFNC Research Fund proposal" in the subject line of your message.

Deliverables:

The Club expects research results to be communicated as widely as is pertinent, with submissions to *The Canadian Field-Naturalist* encouraged, if appropriate.

- State how you plan to communicate the results of your research.
- All grantees must provide a plain language summary of their results for publication in *Trail & Landscape* (the Club's quarterly newsletter that all members receive).
- Grantees may be invited to present a talk about their research at one of the Club's monthly meetings, and to communicate their work on the Club's blog, "Field Notes" (<https://ofnc.wordpress.com/home/>).
- Financial support from the Ottawa Field-Naturalists' Club must be clearly acknowledged in all final documentation.

Coming Events

PLEASE NOTE: The OFNC website (ofnc.ca) contains the most up-to-date information on events. Please check it regularly for additions or changes to events. The Club's Facebook page (www.facebook.com/groups/379992938552/) and Twitter account (@OttawaFieldNat) may also be used to announce last-minute changes to events.

We expect to have several weather- and year-dependent events that are not included in *Trail & Landscape* and will only be announced at the last minute via our website, Facebook and Twitter. These include seasonal events such as Snowy Owl viewing, the spring Snow Goose spectacle, Eardley Eagles, etc.

ALL OUTINGS: Field trips to natural areas in our region and beyond take place all year round. OFNC events are for members only. Prospective members with interest in attending should contact the trip leader in advance. For some events, participation is limited and members will be given priority. All participants will be asked to sign a waiver. Times given for events are departure times. Please arrive earlier, as leaders start promptly. If you need a ride, please contact the leader.

Please bring a lunch on full-day trips and dress according to the weather forecast and activity. Please always wear long pants and closed-toe shoes. Binoculars and/or spotting scopes are essential on all birding trips. Unless otherwise stated, transportation will be by carpool.

MONTHLY MEETINGS: Our monthly meetings are held in the **K.W. Neatby Building, Salon B, at 960 Carling Avenue**. There is ample free parking in the lot on the west side of Maple Drive by Carling Ave., immediately to the east of the main entrance to the Neatby Building. Monthly meetings are open to the general public.

EVENTS ORIENTED TO ALL AGES: Kids are welcome on all of our trips. We highlight some hikes as "oriented to all ages" as these are most likely to be enjoyed by typical children. Depending on your child(ren)'s interests and stamina, please feel free to bring them along on any events. For events tailored to kids, check out the Macoun Field Club (<http://www.ofnc.ca/macoun/index.php>).

**Tuesday
January 10**

**7:00 p.m.
Social**

**7:30 p.m.
Formal
program**

**OFNC MONTHLY MEETING
138th ANNUAL BUSINESS MEETING**

Location: Fletcher Wildlife Garden Interpretive Centre

Description: The Board of Directors for 2017 will be elected at this meeting. There will be a brief review of the activities in 2016 and a statement of the Club's finances will be given. This is an opportunity to meet most of the Club's executives and the chairs of the various committees and to find out what makes your Club tick.

**Saturday
January 14**

7:00 p.m.

to

10:00 p.m.

MEMBERS' PHOTOGRAPHY NIGHT

oriented to all ages

Leaders: Barry Cottam and Hume Douglas

Location: K.W. Neatby Building, 960 Carling Ave.

Description: If you take natural history photos, this is your opportunity to share some of your images with fellow members. The mix of different topics and voices makes for an enjoyable evening. Contributions may be 7-10 minutes long. We can handle most digital presentations (images on a flash-drive), and even conventional slides (with some warning please). We encourage presenters to speak about their images. Please contact Hume Douglas (humedgl (at) gmail.com) or Barry Cottam (b.cottam (at) rogers.com) so that we can organize the presentations.

**Sunday
January 22**

10:00 a.m.

to

Noon

**WINTER SOJOURN TO J. HENRY TWEED
CONSERVATION AREA**

Leader: Owen Clarkin (owen.j.clarkin (at) gmail.com)

Location: 208 Forced Road, Russell, Ontario

Description: Celebrate the depths of winter with an energetic and botany-themed hike in the old forest of J. Henry Tweed Conservation Area, adjacent to the town of Russell. You'll stay warm due to constant motion and discussion, even without a January thaw. This ~16-acre forest contains a remnant climax community at its core with many impressive/old tree specimens (e.g. Basswood, Hemlock, Beech, Red Maple) and high plant biodiversity. If the weather is particularly good, we may continue a bit past noon if there is interest.

Website: <http://www.nation.on.ca/recreation/hikingwalking/j-henry-tweed-conservation-area-russell-ontario>

Sunday
February 5
9:30 a.m.
to
2:00 p.m.

SNOWSHOE IN STONY SWAMP

Leader: Jakob Mueller (Contact: jm890_7 (at) hotmail.com or 613-314-1495)

Meet: 9:30 a.m. beside the Pizza Pizza in the northeast corner of the Lincoln Fields Shopping Centre parking lot (Richmond Road at Assaly Road) OR 10:00 a.m. at NCC parking lot P8 off Moodie Drive.

Description: Get some exercise and explore nature in winter in Ottawa's Greenbelt. We will look for wildlife activity and take in winter landscapes and fresh air. Snowshoes are a convenient way to explore NCC trails in winter – bring your own or rent from one of the many sporting goods suppliers in Ottawa. Pack a lunch, a drink, and dress in layers. In the unlikely event that there is no snow pack, this event will be cancelled.

Tuesday
February 14
7:00 p.m.
Social
7:30 p.m.
Presentation

OFNC MONTHLY MEETING

HERBICIDES, BEETLES, AND THE DECLINE OF INSECTIVOROUS BIRDS

Speaker: Henri Goulet

Location: Salon B, K.W. Neatby Building, Central Experimental Farm, 960 Carling Avenue

Henri will discuss what might be behind the demise of insectivorous birds in the Ottawa and Montreal areas, and insects as they are relevant to birds as food. Before the 1970s, insectivorous birds were abundant in these regions. By the end of the 1970s, insectivorous birds' abundance started to decline. Because of his field experience in the early 1960s, Henri was able to replicate the diversity of ground beetles found by earlier collectors and scientists in the first half of the 20th century. Notes about species and habitat where these beetles were captured were recorded. Almost every species was identified on the spot. Upon his return to eastern Canada in the late 1970s, Henri noticed a drop in ground beetle diversity. This drop became a lot more evident during the 1980s and 1990s. This drop was also noticed in the very diverse sawfly genus *Tenthredo* and a large group of ground scelionid wasps. The main factor was the establishment of the commercial corn crops (in time, also soybean crops). These crops per se are not a problem, but the herbicide protocol presented a very special problem affecting many groups of insects (most not studied by entomologists) and, not least, insectivorous birds. Henri will discuss the implications of herbicides on these crops before and after 1975 in relation to these insect groups and the impact on insectivorous birds in our area. *Monthly meetings are open to the general public.*

**Saturday
February 18
7:00 p.m.
to
10:00 p.m.**

MUDPUPPY NIGHT

Kid friendly

Leaders: Fred Schueler and Aleta Karstad

Meet: 7:00 p.m. at Maplewood Hall, 100 Maplewood Avenue, Oxford Mills, Ontario.

Description: Come out for an indoor presentation on the Mudpuppy, Canada's largest salamander. Then head outside to count, catch live, touch, and examine wild Mudpuppies: amphibians in the middle of winter, often mistaken by ice-fishers as a missing link in evolution! The Oxford Mills dam seems to be the best place in this species' global range for observing it during its period of winter activity. Bring your brightest handheld light or headlamp, and your tallest rubber boots to wade in the stream, or your warmest winter boots to keep warm next to the stream. Dress very warmly, as you will spend time outdoors. If the weather creates dangerous driving conditions, this outing will be postponed. If in doubt, please call Fred at 613-258-3107 or e-mail him at [bekcdb \(at\) istar.ca](mailto:bekcdb@istar.ca). More information is available at: <http://pinicola.ca/mudpupl.htm>

**Saturday
February 25
7:00 p.m.
to
10:00 p.m.**

OFNC AWARDS NIGHT

Especially Kid-Friendly

Location: St. Basil's Parish Church, 940 Rex Avenue, Ottawa. Enter from Maitland Avenue (east side) just north of the Queensway.

Description: Join us for some fun at our annual wine and cheese party and celebrate with the honoured winners of our Annual Awards. Photographers and artists will exhibit their works for everyone to enjoy; the judged photo display will be digital only. Kids, bring your natural history displays.

See insert in this issue of *Trail & Landscape*.

Thursday
March 2
8:00 a.m.
to
Noon

BEGINNER BIRDING IN WINTER - FOREST BIRDS AND WINTER GULLS

Leaders: Rick Collins and Heather Pickard

Meet: 8 a.m. at the Jack Pine Trail at Stony Swamp, parking lot 9 on Moodie Drive

Description: This event is a guided bird walk for beginners to birding. Ottawa's Greenbelt trails are alive with birds in winter, especially where bird feeders supply a reliable source of bird food. At the Jack Pine Trail we can expect to find many species of birds on which to practice basic ID skills by using the FOUR KEYS to BIRD ID: 1- size & shape, 2- colour pattern, 3- habitat and 4- behaviour. After exploring the forest trails we will drive to the nearby landfill or fields to seek winter gulls and perhaps a few raptors. Bring your binoculars, a snack, warm drink, and dress for the weather. Note that trip leaders may not be able to attend in the event of hazardous driving conditions or extreme weather, and the event will not take place.

Tuesday
March 14
7:00 p.m.
Social
7:30 p.m.
Presentation

OFNC MONTHLY MEETING

METEORS AND METEORITES: ROCKS FROM THE SKY

Speaker: Howard Simkover

Location: Salon B, K.W. Neatby Building, Central Experimental Farm, 960 Carling Avenue

For hundreds of thousands of years, humans have gazed up into the night sky at shooting stars. These sudden flashes of light – called meteors – are caused by tiny particles from space plunging into the Earth's atmosphere at very high speeds and burning up. Several times per year, such as during the Perseids in mid-August, we experience a meteor shower. Perhaps we've all had the experience of "wishing on a falling star".

On occasion, a much larger "rock from space" – a meteorite – enters the atmosphere and can even impact the surface of our planet, causing a crater. As far as we know, only one person has ever been struck by a falling meteorite.

In February 2013, a huge object from space exploded over the city of Chelyabinsk, Russia, leading to thousands of injuries from flying glass. It appears that 65.5 million years ago, something much worse happened to the dinosaurs, who experienced a very bad day when an asteroid the size of Ottawa came calling....

Howard Simkover, who has produced shows for **Montreal's Dow Planetarium**, will share his experiences and knowledge of meteors and meteorites.

Monthly meetings are open to the general public.

Friday
April 28
8:00 a.m.
to
11 a.m.

BEGINNER BIRDING IN SPRING

Location: Mud Lake – Cassels Street in Britannia

Leader: Tamara Bloom (tamaradebra (at) gmail.com)

Meet: 7:45 a.m. at Lincoln Fields parking lot (near Pizza Pizza on the Richmond Rd side of Lincoln Fields) or 8:00 a.m. at Mud Lake

Description: This will be an introductory guided walk for beginners to birding. Building on the four keys to bird identification (size and shape, colour pattern, habitat and behaviour), you will also be encouraged to tune in to the sounds of the natural world around us. Come out and learn about bird song as well as tricksters like red squirrels, cicadas and tree frogs. We will tour the area around Mud Lake focusing on land birds, both year-round residents and early migrants. Bring a snack, beverage, notebook and binoculars if possible. Open your eyes and ears to a whole new world but beware – you may get bitten by the birding bug! Outing will be postponed in the event of rain. Rain date is Friday, May 12.

ANY ARTICLES FOR *TRAIL & LANDSCAPE*?

Have you been on an interesting field trip or made some unusual observations?
Write up your thoughts and send them to *Trail & Landscape*.

DEADLINE: *Material intended for the April-June issue must be in the editor's hands by February 1, 2017. Send your articles to:*

Annie Bélair

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*Black-backed Woodpecker, Stony Swamp, Ottawa, Dec. 13, 2014.
Photo by Jakob Mueller.*

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